

every house demolished, and debris scattered around country; negro killed and body blown considerable distance; four people injured, one afterwards died, hogs, cows and horses killed." A tornado also probably originated near Stoney creek and, moving WNW., passed about 1½ mile east of Ford's depot in Dinwiddie Co.; about 12 p. m. it swept across the Atlantic, Mississippi and Ohio R. R. in a northerly direction; track, 40 and 50 feet wide, soon spreading to about 300 feet; trees, barns and small houses blown down, and timbers scattered broad-cast; a little later a tornado is reported to have crossed the Richmond and Danville R. R. at two points, one or two miles west of Burkeville, trees twisted off, &c., course NW. In Chesterfield Co., between Summit and Clover Hill, "for a distance of eight miles, and width of 100 yards, destroyed everything, and houses completely demolished; eight persons injured." At Boshers' Dam, cyclone passed into Henri Co., "ravage fearful to contemplate; buildings demolished; one person killed, several injured." In Hanover Co., at Short Pump, "tornado took a NW. direction, track 125 yards wide, sweeping everything, cutting an avenue through the woods." 12th, "the 'Northeaster' did considerable damage to shipping on Lake Erie." "Schooner 'Starling' went ashore two miles east of Vermillion." "Schooner 'Everly,' at Pigeon Bay, parted anchors." Schooner "Provost" parted anchor at Put in Bay, and was driven on outside bar. At Baumhart Inlet, near North Amherst, Ont., schooners "Sterling" and "Light" were totally wrecked.

VERIFICATIONS.

Indications.—The detailed comparison of the tri-daily weather indications with the telegraphic reports, for the succeeding twenty-four hours, shows a general percentage of omissions of 0.7 per cent, and of verifications of 84.9 per cent. The percentage of verifications for the four elements have been: weather, 89.3; wind, 81.6; temperature, 85.5; barometer, 83.4. The percentages of verifications by geographical districts have been: New England, 83.5; Middle States, 85.9; South Atlantic States, 89.2; East Gulf States, 83.4; West Gulf States, 89.5; Lower Lake region, 81.9; Upper Lake region, 83.3; Tennessee and Ohio valley, 85.8; Upper Mississippi valley, 84.2; Lower Missouri valley, 82.8. Of the 3,573 predictions that have been made, 124, or 3.5 per cent are considered to have entirely failed; 147, or 4.1 per cent were one-fourth verified; 436, or 12.2 per cent were half verified; 342, or 9.6 per cent were three-fourths verified; 2,524 or 70.6 per cent were fully verified, so far as can be judged from the weather maps.

Cautionary Signals.—During the month 158 Cautionary Signals were displayed; 130, or 82.3 per cent, were justified by subsequent hourly velocities of 25 miles or over at, or within, 100 miles of the station.

Cautionary Off-shore Signals.—Of these, seventeen were displayed, of which 14 or 82.4 per cent. were justified, both as to velocity and direction, at or within 100 miles of station; of the remaining three, one was justified as to direction but not by velocity, and two were not justified by either. Forty-three cases were reported, generally from scattered stations, of winds of 25 miles or over, when signals were not ordered.

NAVIGATION.

Stages of Water in Rivers.—In the table on the right-hand of Chart No. III are given the highest and lowest readings of the Signal Service river gauges during the month, with the dates of same.

During the latter portion of the month *Navigation* on Upper Mississippi was at a standstill, on account of low water—river only one foot above extreme low water mark, no arrivals at Daveuport since the 19th—no boats able to run above La Crosse, all large packets laid up. At Mobile Ala., on the 11th, water in river fell three to four feet retarding navigation. Following the heavy rains of the 12th and 13th, a heavy rise occurred in the Ohio, and in this connection the following notes may be of interest: at Pittsburg the river rose from three feet on the 13th, to 10 feet 8 inches on the 14th. 16th, river falling, "business on river very active, six and a half million bushels of coal shipped down the river on the late rise." At Cincinnati, on the 15th, river rose 20 feet, 8 in. in 24 hours, ending 3 p. m., and rising at the rate of 6 inches per hour; this was the most sudden rise on record; current strong and river filled with heavy drift; several barges drifted away, and one containing 5,000 bushels of coal sunk. 16th, river rose 9 feet; heavy drift passing all day, with fragments of houses, &c.; rising about 1 inch per hour since 3 p. m. 17th, river reached 36 feet, 6 in. during a. m.; small driftwood all day. 18th, river falling; very light drift. At Louisville, on the 16th, light driftwood in river. 17th, heavy driftwood in river. At Cairo, on the 21st, river rose 5 feet, 7 in.; much driftwood. 22nd, river rose 4 feet, 5 in.; driftwood. 23rd, river rose 1 foot, 1 in.; driftwood.

High Tides.—Mt. Desert, Me., 26th; Indianola, Tex., 26th, 29th, 30th; Savannah, Ga., 29th, unusually high tides; Charleston, S. C., 11th, tide unusually high; Smithville, N. C., 11th, 12th, highest tides known for years; Portsmouth, N. C., 12th, tides extremely high in sound; submerging beach and making roads almost impassable; 28th to 30th, tides high and beach submerged; Cape May, N. J., 26th to 28th; Baltimore, Md., 13th, wharves and streets overflowed.

ATMOSPHERIC ELECTRICITY.

Thunder-storms.—1st, N. Y., Va., Ill., Ia., Me., Mo., N. H., N. J., Ohio, Pa., S. C. Vt., Col., Fla., Ala., Minn., Mass. 2nd, Mass., Mich., N. Y., Va., Ill., Ind., Me., N. H., N. C., Ohio, S. C. Vt., Ala. 3rd, N. Y., Conn., Me., Mass., N. J., Ohio, Pa., Utah, Vt., Va., Mich., W. Va., Ga., N. C. 4th, Fla., N. Y., Va., Conn., N. J., Pa., Tex., Col., Ga., N. C. 5th, N. Y., Va., Conn., Mass., Neb., N. J., Pa., Wis., Col., Dak., Mich., N. C., Conn. 6th, Col., Ia., Kan., Mo., Neb., Wis., Tex., N. C., Me. 7th, Wy. Ty., Ia., Kan.,

Tex., Cal., Dak., Mich. 8th, Ill., Ind., Ia., Kan., Neb., Tex., Wis., Wy. Ty. 9th, Ind., Kan., Mich., Neb., Tex., Wy. Ty., Mo. 10th, Ill., Mich., Wy. Ty. 15th, Dak., Ia., Minn. 16th, Wy. Ty., Mich., Utah, Nev. 17th, N. M., Mich., Neb. 18th, Neb., Col., Ia., Utah, Tex., Minn. 19th, Neb., Dak., Ia., Kan., Mo., Neb., Wis., Tex., Mich. 20th, Ark., Ill., Ind., Ia., Kan., Mich., Mo., Tex., Wis., Neb. 22d, Ala., Dak., Minn. 23d, Fla., Ga., Ill., Ia., Mo., Dak., Ala., Wis. 24th, Dak., Ill., Ia., Kan., Wis. 25th, Mich., Ill., Ind., Ia., Kan., Mich., Ohio, Tenn., Tex., Mo., Wis., Ky. 26th, N. Y., Conn., Ill., Me., Md., Mass., Miss., Mo., N. J., Ohio, Pa., Tex., Va., Ala. 27th, Fla., Ark. 28th, Kan., Mo. 29th, Ia., Kan., Neb., Dak., Wis. 30th, Neb., Col., Minn.

Auroras.—Pembina, Dak., 25th; Bangor, Me., 28th, 29th; Thatcher's Island, Mass., 22nd; Burlington, Vt., 22nd, 29th; Eastport, Me., 27th, 29th, 30th; Newbury, Vt., 21st; Gainesville, Ga., 24th; Mt. Sterling, Ill., 19th; Vevay and New Corydon, Ind., 26th; Nora Springs, Ia., 6th; Gardiner, Me., 22nd; Orono, Me., 27th; Mechanics Falls, Me., 30th; Waltham, Mass., 29th; North Lewisburg, Ohio, 23d; Woodstock, Vt., 26th; West Charlott, Vt., 23d.

Telegraphic Communication interfered with by Atmospheric Electricity.—Umatilla, Or., 21st, during a high wind instruments became intensely electrified, sparks were drawn by the finger from the circuit wires and all metal parts of the instruments, some of the joints emitted a crackling sound; 26th, during gust of wind instruments electrified. Santa Fe, N. M., 1st, 4th, very great on wires. Pembina, Dak., 18th, very strong on wires; 29th, between 8 and 10 p. m., line unmanageable; 30th, on wires.

OPTICAL PHENOMENA.

Solar Halos.—1st, Ind., Miss. 2nd, Tex. 3rd, Tex., Conn., R. I. 4th, Miss. 5th, Tex. 7th, Iowa. 8th, Ohio. 9th, Ohio. 11th, N. C., Mass. 12th, Nev. 13th, Ohio. 15th, Wis., Ohio. 16th, Ohio, Iowa. 17th, Conn, N. Y., Neb., R. I., Vt. 18th, Tex. 20th, Ind., Ohio. 23rd, Ind., N. Y., Pa., W. Va., Ohio. 24th, Iowa, Idaho, Conn. 25th, R. I. 26th, Ind., Kan., Fla. 27th, Ohio, Ky. 28th, N. J., Ohio, Pa., N. C. 29th, Tex. 30th, Conn.

Lunar Halos.—1st, Tex. 3rd, Tex. 4th, Ga., Wis., N. C. 5th, N. J., Fla., Tex. 6th, Ia., Neb., N. J., Tex., Ind. Ty., Fla., Minn., Ga., Conn., Mass. 7th, Miss., Mo., Tex., Va., Kan., Minn., Ga., S. C., Conn., Mass. 9th, Ind., N. J., Minn., Ohio, Mich., Ga., Va. 10th, N. J., Tex., Minn., Conn. 11th, Nev., Tex., Minn., Ill., W. Va., Me. 12th, Wis., Dak., Tex., Minn. 13th, Ind., Md., N. J., Tex., Minn. 14th, N. J., Tex., Ia., Ill., Mass. 15th, Dak., Tex., Wis. 16th, Ia., Tex., Mich., Ill. 17th, Nev., Tex., Ill. 19th, Tex. 20th, Ind., Tex. 23rd, Ind. 30th, Tex.

Mirage.—New Bedford, Mass, 28th to 30th; Fall River, Mass., 23d; New London, Conn., 8th, 14th, 22d, 23d, 27th, 28th; Burlington, Vt., 24th.

MISCELLANEOUS PHENOMENA.

BOTANICAL.—*Arkansas*—Helena, 3d, if town keeps healthy, cotton will come in, in a few days. *Colorado*—Summit, Rio Grande Co.: The following is a brief summary of an attempt to raise vegetables at the altitude of 11,300 feet, (latitude 37° 28' N., longitude 106° 30' W.): June 14th, radish and turnip seeds sown; 26th, maize, mexican beans, peas, potatoes, beets, kohlrabi, horse radish, parsley and spinach planted; 29th, lettuce sown; July 13th, peas up; 20th, potatoes; 25th, corn, beets and spinach; 31st, radishes ripe. August 1st, horse-radish up. Radishes grew to be roots five inches long and half an inch thick: turnips, three-quarters of an inch in diameter; Indian corn-stalks, three feet high; mexican beans, three feet high; peas, five inches high and blossomed, no fruit; potatoes, stems six inches high, tubers three-quarters of an long; beets, four inches long and one-eight of an inch thick; khol-rabi and parsley did not come up; horse radish one and one-half inches high; spinach and lettuce, three inches high. September 20th, frost killed everything in garden, except lettuce and spinach. *Connecticut*: New London, 30th, white dahlia in bloom. *Florida*: Milton, 30th, all crops harvested, except sweet potatoes. Sugar cane in market since first of the month. *Indiana*: Milford, 22d, in bloom, strawberries, blackberries, plums, lilacs, currants and dog wood. *Iowa*: Fort Madison, 20th, potatoes very poor; fruit abundant and good; corn crop very good. Guttenburg—20th, potato crop very small. *Kansas*—Independence, 30th, corn crop severely injured by drought; acreage of winter wheat sown only one third that of last year. *Louisiana*—Concordia Parish, 2nd, cotton is opening very rapidly; all hands are picking; worms have appeared in portions of the field and are eating in spots; crops of this parish far below those of last year. *Massachusetts*—Waltham, ripe, 8th, indian corn; 7th, wild grapes; fading of leaves, 4th, blackberry, 7th, wild grape, 20th, alder, 17th, hazel bush, white birch, 23rd, red maple. Watertown, 9th, grapes ripe. *Mississippi*—Newton, 5th, farmers picking cotton, as it is opening very rapidly. Durant, 4th, cotton crop very poor. Torrence, 5th, cotton opening very rapidly. Summit, 4th, all crops very good. Brookhaven, 4th, forest leaves beginning to change color; ripe, 25th, persimmons, winter grapes; hops in full bloom twenty days later than usual. *Missouri*—Lebanon, 25th, tobacco crop almost a failure, because of dry weather; harvesting corn, crop poor. Corning, 20th, the tenderest flowers are as green and blooming as in summer. Springfield, 30th, winter wheat sown; many cherry and apple trees still in full bloom; one apple tree of Red June variety has fully ripened its second crop. *New Jersey*—Vineland, 30th, foliage of cherry, maple, cottonwood and some others faded and mostly fallen. Freehold, 12th, second crop of strawberries gathered. *New Hampshire*—Auburn, 30th, apple crop good;